DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. **Claims 1, 3, 14, 15, 19, 22-25, and 29** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gardner et al.** (hereinafter Gardner) (Non-Patent Literature - “Techniques for Finding Ring Covers in Survivable Networks") in view of **Grover et al.** (hereinafter Grover) (U.S. Patent # 6,819,662 B1).

Consider **claims 1, 16, 23, and 24**, Gardner discloses a processor-implemented method, comprising:

receiving, at the processor, network configuration information (page 2, column 1, line 35; input a network N) and traffic demand information (page 2, column 1, lines 24-27; link traffic weight and costs) for a network;

generating, by the processor, a plurality of ring cover candidates (page 1, column 2, lines 19-24), each ring cover candidate including a plurality of rings (page 1, column 2, lines 5-6), based on the network configuration information and the traffic demand information, each of the rings including a plurality of network spans (page 2, column 1, lines 36-38; page 2, column 2, lines 4-14), where the generating the ring cover candidate includes generating the plurality of ring cover candidates by using a different process to generate each of the ring cover candidates (page 4, column 2, lines 24-55; page 5, column 1, lines 1-7; figures 4-7; different processes/procedures are utilized to determine ring cover candidates for the network).

However, Gardner may not expressly disclose counting, for each ring cover candidate of the plurality of ring cover candidates, a number of loaded network spans covered by the ring cover candidate; and selecting one of the plurality of ring cover

candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans.

Nonetheless, in the same field of endeavor, Grover discloses counting, for each ring cover candidate of the plurality of ring cover candidates, a number of loaded network spans covered by the ring cover candidate (abstract; column 29, lines 34-38; column 32, lines 12-15 and 35-39); and selecting one of the plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans (column 10, lines 24-38; column 29, 51-59; suggests the more demand routes a candidate can carry, the better the candidate will be, thus choosing the best candidate).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate counting the loaded network spans and selecting the ring cover candidates based on the loaded spans as taught by Grover with the method as disclosed by Gardner for the purpose of effectively identifying and designing a more efficient ring cover candidate in order to restore a network.

Consider **claim 3**, Gardner, as modified by Grover, further discloses creating a spanning tree from a plurality of loaded network spans of the network (page 1, column 2, lines 32-43).

Consider **claim 19**, Gardner, as modified by Grover, further discloses where the at least one processor is further to store each of the rings of the at least one ring cover candidate in span linked lists associated with ones of a plurality of network spans of the

network covered by the rings in the at least one storage device (page 1, column 2, lines 24-31).

Consider **claims 22 and 29**, Gardner, as modified by Grover, discloses the claimed invention, but may not expressly disclose wherein the at least one processor is further configured to rank each of a plurality of rings included in the at least one ring cover candidate, the rank being based on a measure of a benefit of including a respective ring in the at least one ring cover candidate versus a measure of a cost of including the respective ring in the at least one ring cover candidate.

Nonetheless, Grover further discloses wherein the at least one processor is further configured to rank each of a plurality of rings included in the at least one ring cover candidate (column 14, lines 19-31), the rank being based on a measure of a benefit of including a respective ring in the at least one ring cover candidate versus a measure of a cost of including the respective ring in the at least one ring cover candidate (abstract; column 15, lines 1-15).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate ranking each of the ring candidates as taught by Grover with the method as disclosed by Gardner, as modified by Grover, for the purpose of effectively identifying and designing a more efficient ring cover candidate in order to restore a network.

Consider **claim 25**, Gardner, as modified by Grover, further discloses to create a spanning tree based on loaded ones of the network spans (page 1, column 2, lines 32-43), to generate a plurality of fundamental rings based on the spanning tree, and to

generate a plurality of rings based on the generated fundamental rings (page 3, column 2, lines 2-5 and 13-15).

3. **Claims 2, 9-13, 17, and 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gardner et al.** (hereinafter Gardner) (Non-Patent Literature - “Techniques for Finding Ring Covers in Survivable Networks") in view of **Grover et al.** (hereinafter Grover) (U.S. Patent # 6,819,662 B1), and further in view of **Chow et al.** (hereinafter Chow) (U.S. Patent # 7,133,410 B2).

Consider **claims 2, 17, and 30**, Gardner, as modified by Grover, discloses the claimed invention, but may not expressly disclose generating and outputting at least one report describing characteristics of the ring cover candidate.

Nonetheless, in the same field of endeavor, Chow discloses generating and outputting at least one report describing characteristics of the ring cover candidate (column 3, lines 7-11; column 6, lines 48-55; column 13, lines 56-60).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate outputting a report describing characteristics of the ring cover candidate as taught by Chow with the method as disclosed by Gardner, as modified by Grover, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 9**, Gardner, as modified by Grover and Chow, discloses the claimed invention, but may not expressly disclose where the at least one report includes characteristics of each of the rings included in the ring cover candidate.

Nonetheless, Chow further discloses where the at least one report includes characteristics of each of the rings included in the ring cover candidate (column 3, lines 7-11; column 6, lines 48-55; column 13, lines 56-60).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a report describing characteristics of the ring cover candidate as taught by Chow with the method as disclosed by Gardner, as modified by Grover and Chow, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 10**, Gardner, as modified by Grover and Chow, discloses the claimed invention, but may not expressly disclose where the characteristics of each of the rings include a ring identifier, a number of nodes covered by a corresponding one of the rings, and a length of the corresponding one of the rings.

Nonetheless, Grover further discloses where the characteristics of each of the rings include a ring identifier (column 5, lines 43-46), a number of nodes covered by a corresponding one of the rings (column 4, lines 47-49; column 27, lines 51-65), and a length of the corresponding one of the rings (column 28, lines 66-67; column 29, lines 1-4).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the characteristics of each ring as taught by Grover with the method as disclosed by Gardner, as modified by Grover and Chow, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 11**, Gardner, as modified by Grover and Chow, discloses the claimed invention, but may not expressly disclose where the at least one report includes information about network spans not covered by any valid ones of the rings of the ring cover candidate.

Nonetheless, Chow further discloses wherein the at least one report includes information about network spans not covered by any valid ones of the rings of the ring cover candidate (column 3, lines 7-11; column 6, lines 48-55; column 13, lines 56-60).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a report describing characteristics of the ring cover candidate as taught by Chow with the method as disclosed by Gardner, as modified by Grover and Chow, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 12**, Gardner, as modified by Grover and Chow, discloses the claimed invention, but may not expressly disclose where the at least one report includes information about network spans not covered by any ones of the rings of the ring cover candidate.

Nonetheless, Chow further discloses where the at least one report includes information about network spans not covered by any ones of the rings of the ring cover candidate (column 3, lines 7-11; column 6, lines 48-55; column 13, lines 56-60).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a report describing characteristics of the ring cover candidate as taught by Chow with the method as disclosed by Gardner, as

modified by Grover and Chow, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 13**, Gardner, as modified by Grover and Chow, discloses the claimed invention, but may not expressly disclose where the at least one report provides characteristics of each of the plurality of ring cover candidates.

Nonetheless, Chow further discloses where the at least one report provides characteristics of each of the plurality of ring cover candidates (column 3, lines 7-11; column 6, lines 48-55; column 13, lines 56-60).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a report describing characteristics of the ring cover candidate as taught by Chow with the method as disclosed by Gardner, as modified by Grover and Chow, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

4. **Claims 4-8, 18, 21, and 26-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gardner et al.** (hereinafter Gardner) (Non-Patent Literature - “Techniques for Finding Ring Covers in Survivable Networks") in view of **Grover et al.** (hereinafter Grover) (U.S. Patent # 6,819,662 B1), and further in view of **Kennington et al.** (hereinafter Kennington) (Non-Patent Literature - “Optimization Based Algorithms for Finding Minimal Cost Ring Covers in Survivable Networks").

Consider **claim 4**, Gardner, as modified by Grover, discloses the claimed invention, but may not expressly disclose generating a plurality of second rings by

combining two of the plurality of first rings; and generating a plurality of third rings by combining one of the second rings with one of the first rings.

Nonetheless, in the same field of endeavor, Kennington discloses generating a plurality of second rings by combining two of the plurality of first rings; and generating a plurality of third rings by combining one of the second rings with one of the first rings (page 3, lines 12-20; figure 1).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 5**, Gardner, as modified by Grover and Kennington, discloses the claimed invention, but may not expressly disclose generating derived third degree rings and focused third degree rings.

Nonetheless, Kennington further discloses generating derived third degree rings and focused third degree rings (page 3, lines 12-20; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover and Kennington, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 6**, Gardner, as modified by Grover and Kennington, discloses the claimed invention, but may not expressly disclose where at least some of the third rings and the second rings are based on an invalid first ring

Nonetheless, Kennington further discloses where at least some of the third rings and the second rings are based on an invalid first ring (page 3, lines 1-20; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover and Kennington, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 7**, Gardner, as modified by Grover and Kennington, discloses the claimed invention, but may not expressly disclose storing information regarding the first rings, the second rings and the third rings in span-linked lists associated with respective ones of a plurality of network spans covered by the first rings, the second rings and the third rings.

Nonetheless, Kennington further discloses storing information regarding the first rings, the second rings and the third rings in span-linked lists associated with respective ones of a plurality of network spans covered by the first rings, the second rings and the third rings (page 3, lines 12-20; figure 1; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught

by Kennington with the method as disclosed by Gardner, as modified by Grover and Kennington, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 8**, Gardner, as modified by Grover, discloses the claimed invention, but may not expressly disclose generating a third ring cover candidate by using cheapest ones of the rings from the first ring cover candidate.

Nonetheless, in the same field of endeavor, Kennington discloses generating a third ring cover candidate by using cheapest ones of the rings from the first ring cover candidate (abstract; page 7, lines 18-23; page 8, lines 1-2).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 18**, Gardner, as modified by Grover, discloses the claimed invention, but may not expressly disclose where the at least one processor is configured to generate a plurality of rings for each of the plurality of ring cover candidates, the plurality of rings including a plurality of fundamental rings, a plurality of second degree rings, and a plurality of third degree rings.

Nonetheless, in the same field of endeavor, Kennington discloses where the at least one processor is configured to generate a plurality of rings for each of the plurality of ring cover candidates, the plurality of rings including a plurality of fundamental rings

(figure 2), a plurality of second degree rings, and a plurality of third degree rings (page 3, lines 12-20; figure 1; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 21**, Gardner, as modified by Grover, discloses the claimed invention, but may not expressly disclose to generate a first ring cover candidate by using shortest ones of the rings formed on loaded network spans, to generate a second ring cover candidate by using shortest ones of the rings formed on a maximum number of uncovered network spans, and to generate a third ring cover candidate by using shortest ones of the rings from the first ring cover candidate.

Nonetheless, in the same field of endeavor, Kennington discloses to generate a first ring cover candidate by using shortest ones of the rings formed on loaded network spans, to generate a second ring cover candidate by using shortest ones of the rings formed on a maximum number of uncovered network spans, and to generate a third ring cover candidate by using shortest ones of the rings from the first ring cover candidate (page 3, lines 1-20; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover, for the

purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 26**, Gardner, as modified by Grover, discloses the claimed invention, but may not expressly disclose wherein the plurality of rings based on the generated fundamental rings include at least one of second degree rings and third degree rings.

Nonetheless, in the same field of endeavor, Kennington discloses wherein the plurality of rings based on the generated fundamental rings (figure 2) include at least one of second degree rings and third degree rings (page 3, lines 12-20; figure 1; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 27**, Gardner, as modified by Grover and Kennington, discloses the claimed invention, but may not expressly disclose to attempt to create a focused third degree ring to cover a network span when the network span is covered only by an invalid fundamental ring.

Nonetheless, Kennington further discloses to attempt to create a focused third degree ring to cover a network span when the network span is covered only by an invalid fundamental ring (page 3, lines 1-20; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover and Kennington, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Consider **claim 28**, Gardner, as modified by Grover and Kennington, discloses the claimed invention, but may not expressly disclose where the plurality of rings based on the generated fundamental rings are formed by combining a fundamental ring with another of the rings, and the fundamental ring and the another of the rings have a network span in common.

Nonetheless, Kennington further discloses where the plurality of rings based on the generated fundamental rings (figure 2) are formed by combining a fundamental ring with another of the rings, and the fundamental ring and the another of the rings have a network span in common (page 3, lines 1-20; page 4, lines 1-9).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate generating a plurality of rings as taught by Kennington with the method as disclosed by Gardner, as modified by Grover and Kennington, for the purpose of effectively identifying and designing a ring cover candidate in order to restore a network.

Response to Arguments

5. Applicant's arguments filed January 15, 2010 have been fully considered but they are not persuasive.

Consider claims 1, 16, 23, and 24, Applicant argues, on pages 3-6 of the Remarks, that Gardner and Grover do not teach or suggest “selecting one of the plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans".

The Examiner respectfully disagrees with Applicant's argument because as recited in the above rejections, Gardner, as modified by Grover, does teach and suggest selecting one of the plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans.

Gardner teaches and discloses techniques for finding ring covers in survivable networks. Gardner discloses generating a plurality of ring cover candidates based on received network configuration information and traffic demand information for a network (page 1, column 2, lines 5-6 and 19-24; page 2, column 1, lines 4-14, 24-27, and 35-38). Grover teaches and suggests determining the number of loaded spans covered by the ring candidate (abstract; column 29, lines 34-38; column 32, lines 12-15 and 35-39). Grover goes on to further suggest that the more demand routes a ring candidate can carry, the better utilized and hence more efficient the resulting ring candidate will be (column 10, lines 24-38; column 29, 51-59). Thus in determining the best ring candidate to select, Grover suggests the system should consider choosing the ring candidate with the highest number of demand routes. Therefore, it would have been

obvious to a person of ordinary skill in the art at the time the invention was made to incorporate counting the loaded network spans and selecting the ring cover candidates based on the loaded spans as taught by Grover with the method as disclosed by Gardner for the purpose of effectively identifying and designing a more efficient ring cover candidate in order to restore a network.

Applicants are reminded that claims subject to examination will be given their broadest reasonable interpretation consistent with the specification. *In re Morris,* 127 *F.3d 1048, 1054-55 (Fed. Cir. 1997).* As a matter of fact, the "examiner has the duty of police claim language by giving it the broadest reasonable interpretation." *Springs Window Fashions LP v. Novo Industries, L.P.,* 65 USPQ2d 1862, 1830, (Fed. Cir. 2003). Applicants are also reminded that claimed subject matter not the specification, is the measure of the invention. Disclosure contained in the specification cannot be read into the claims for the purpose of avoiding the prior art. *In re Sporck,* 55 CCPA 743, 386 F.2d, 155 USPQ 687 (1986).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any response to this Office Action should be **faxed to** (571) 273-8300 **or mailed to**:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

8. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Suk Jin Kang whose telephone number is (571) 270-1771. The examiner can normally be reached on Monday - Friday 8:00-5:00 EST.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Chirag Shah can be reached on (571) 272-3144. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

/Suk Jin Kang/
Examiner, Art Unit 2477

April 8, 2010

/Gregory B Sefcheck/
Primary Examiner, Art Unit 2477
4-8-2010